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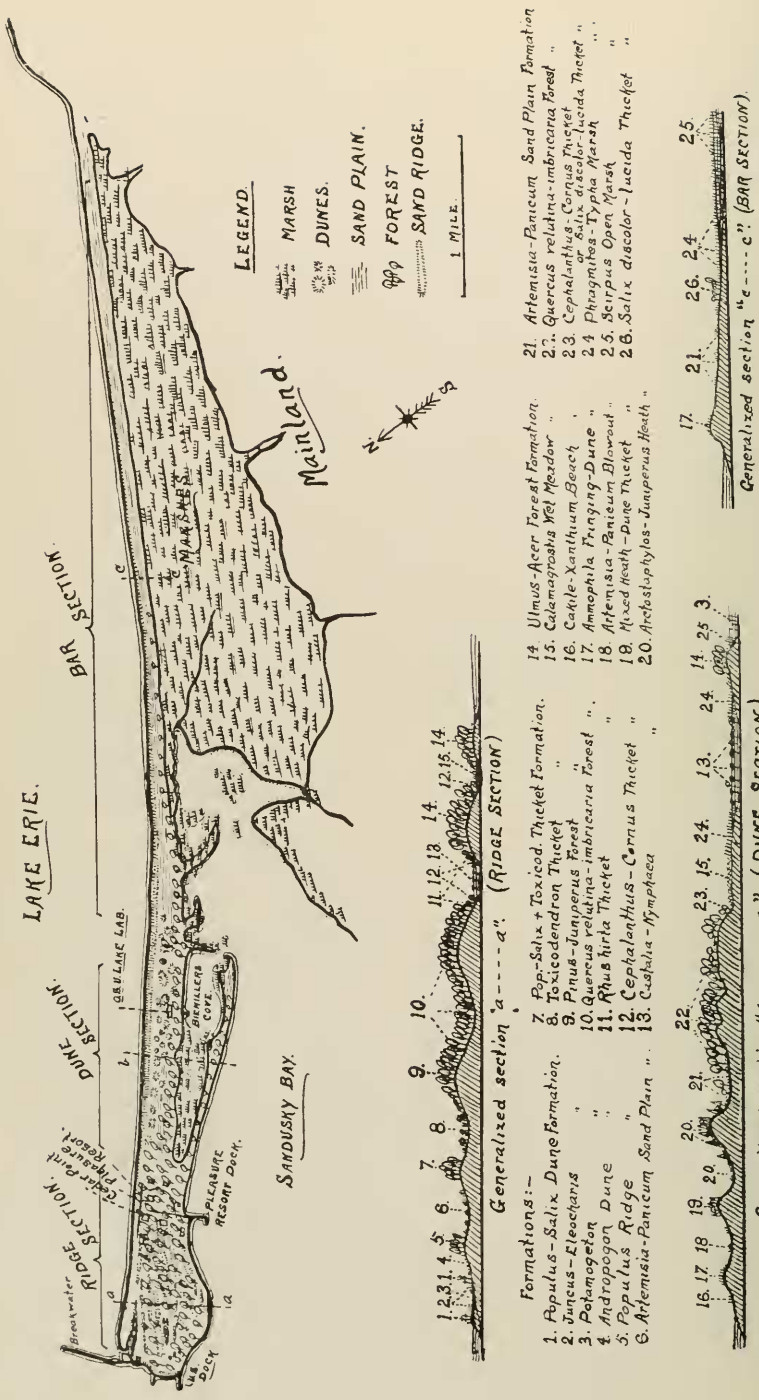
## THE BIRDS OF CEDAR POINT AND VICINITY.

BY LYNDS JONES.

The place referred to is Cedar Point, Erie county, Ohio. It lies at the west end of a long sand spit which forms the eastern barrier protecting the entrance to Sandusky harbor. The name "Cedar Point" as here used is intended to cover the whole of the seven miles of sand spit, which begins at Rye Beach, some two miles west of Huron, and not merely that portion of it which is occupied by the summer resort grounds.

The territory which is covered by this list includes the topographical quadrangles of Oberlin, Vermilion, Sandusky, and Put-in-Bay and the adjacent islands of Pelee, Hen and Chickens, East Sister, and Middle. Standing at Cedar Point its 'Vicinity' as here used may appear too extensive and much too scattered, but from the standpoint of a study of bird movements this vicinity becomes of vital importance not merely to bring in comparisons with other localities which are topographically very unlike the beach and its accompanying swamps, but more to show the direction of these bird movements.

The beginning of the work upon which this list is based dates back to the autumn of 1890, when the writer began his residence in Oberlin. Previous to this time there had been some good but somewhat scattered work done by Messrs.



**LEGEND**

MARSH  
 DUNES.  
 SAND PLAIN.  
 FOREST  
 SAND RIDGE.  
 1 MILE.

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 12, 15, 14

Generalized section "a-a'" (RIDGE SECTION)

Formations:-

1. *Populus-Salix* Dune Formation.
2. *Junceus-Islecharis* "
3. *Potamogeton* "
4. *Andropogon* Dune "
5. *Populus* Ridge "
6. *Artemisia-Panicum* Sand Plain "
7. *Pop-Salix* + Toxicod. Thicket Formation.
8. *Toxicodendron* Thicket "
9. *Pinus-Juniperus* Forest "
10. *Quercus velutina-imbriearia* Forest "
11. *Rhus hirta* Thicket "
12. *Cephalanthus-Cornus* Thicket "
13. *Cashilia-Nymphaea* "
14. 25 3
15. 24
16. 20
17. 18
18. 20
19. 20
20. 21
21. 20
22. 21
23. 15. 24. 13. 24. 20
24. 20
25. 3

Generalized section "b-b'" (DUNE SECTION)

14. *Ulmus-Acer* Forest Formation.
15. *Calamagrostis Wet Meadow* "
16. *Cakile-Xanthium* Beach "
17. *Ammophila-Fragaria-Dune* "
18. *Artemisia-Panicum* Blowout "
19. *Mixed Heath-Dune* Thicket "
20. *Arctostaphylos-Juniperus* Heath "

Generalized section "c-c'" (BAR SECTION)

21. *Artemisia-Panicum* Sand Plain Formation
22. *Quercus velutina-imbriearia* Forest "
23. *Cephalanthus-Cornus* Thicket "
24. *Cephalanthus-Lucida* Thicket "
25. *Phragmites-Typha* Marsh "
26. *Scirpus Open Marsh* "
28. *Salix discolor-Lucida* Thicket "

Fig. 1. Generalized ecological map and transect of Cedar Point. The width of the peninsula is relatively exaggerated to better show the vegetational features, and the finer topographic features are only approximately correct. For more accurate details of topography see Moseley's contribution and the U. S. Geological Survey Topographic Map. (Drawn by Otto Jennings.)

L. M. McCormick and George D. Wilder, mostly in the Oberlin quadrangle, and occasional visits to the vicinity of Sandusky had been made by Drs. J. M. Wheaton and F. W. Langdon, but the work done by these latter gentlemen was mostly if not wholly in the Port Clinton marshes. A one day trip was made by the writer to Kelley's, Put-in-Bay, and Green islands on May 28, 1894, and another of similar duration to the same places on May 27, 1901. In company with Rev. W. L. Dawson, August 5 to 9, 1901, was spent among the islands in a row-boat, the purpose being the study of the birds there. On this occasion landings and studies were made on Middle Bass and North Bass, Sugar, Hen and three Chickens, North Harbor, and East Sister. This study was repeated August 24 to 27, 1904. Again from August 26 to September 2, 1905, was spent among the islands, four days of this time being spent on Pelee Island. The next island studies were made in 1908, when a day's visit to Put-in-Bay, and another day's visit to Pelee, the Chickens, and North Harbor, occupied July 11 and 28 respectively. August 17 to 21 were spent on another cruise among the islands, the most of this time being spent on Pelee, and only brief stops on Big and Little Chicken, North Harbor, and the "Rattle" of Rattlesnake. The distinctively Cedar Point work done by the writer has been the whole of July, and part of the last week of June, 1907 and 1908, and studies of from one to four days duration, especially during the winter season and during the migration months. In conducting these studies an effort was made to have them cover all sorts of weather conditions so that they would be representative. The period covered by these studies of the bird life of Cedar Point is eight years, with the stronger emphasis laid upon the work during the last three years. The most extensive studies, covering the longest period have been made in the Oberlin and Vermilion quadrangles.

I have also drawn upon the work of Professors Herbert Osborn, E. L. Rice, and E. L. Mosely and their students, and upon the work of Mr. R. L. Baird, who made special studies of the birds during the summer term at the Lake

Laboratory. The foundation for the list is a card catalogue which has been kindly furnished me by Professor Herbert Osborn, the director of the Lake Laboratory, compiled by himself and by those who have taught with him there during the existence of the Laboratory.

There have been two notable papers relating to the Cedar Point region proper, to which the reader who wishes to learn particulars which cannot be given within the limits of this paper is referred. One is the "Formation of Sandusky Bay and Cedar Point" (here meaning the whole sand spit) by Professor E. L. Mosely, in the Thirteenth Annual Report of the Proceedings of the Ohio State Academy of Science, 1904. From this paper it is made clear that when the lake was at a much lower level than it is at present there was no bay, the Sandusky river flowing into the lake through a narrow channel somewhere lakeward between Marblehead and Cedar Point, and therefore there was no peninsula as now. Cedar Point must have been a ridge of clay, probably underlaid by shale, and the present bay was a depression, but not even a marsh, lying between the higher land now represented by the mainland and this ridge. The changes, or most of them, which have produced the bay and marshes and sand spit have occurred in historic times, being the result of a tilting of the land at the eastern end and consequent deepening of the lake at its western end.

The other paper is "An Ecological Classification of the Vegetation of Cedar Point" (again meaning the whole of the sand spit) by Otto E. Jennings, published in *The Ohio Naturalist*, Vol. VIII, No. 6, April, 1908, pp. 291-340. To this paper I am indebted for most of the pictures which will accompany this series of articles. The reader who is especially interested in the study of Ecology should not fail to read this exhaustive paper. It is sufficient here to say that bordering the sand spit on the one side are the waters of the lake and on the other, the open waters of the bay, while at its eastern end, for rather more than half of the distance, are the extensive marshes with greater or lesser areas of open water.

The immediate mainland still has remnants of the once dense and heavy forests, alternating with pastures, meadows and plowed fields running to the borders of the marsh. Streams flowing in from the mainland and ridges extending out from the sand spit landward result in numerous coves, some of which are three-quarters surrounded by trees or bushes. Practically the whole extent of the marsh border of the sand spit, down to the water's edge, there is a growth of bushes, mostly willow and button bushes, ranging from a few inches to ten feet high. During the hight of migration these bushes are full of warblers, sparrows, and vireos. Along the narrower reaches of the sand spit, toward its eastern end, cottonwood and willow trees immediately border the marsh fringe of low bushes, only in the wider places being more than straggling individual trees, none of any considerable size. Within the limits of this study many large cottonwood and willow trees which stood on the crest of the ridge have been overturned and washed away at times of high water and the crest of the ridge moved marshward. More of this destructive work has been done near Rye Beach, at the eastern end of the sand spit, than elsewhere. It is clear that here, at least, the lake is pushing the bar back into the marsh at the rate of many feet a year. Along this narrower part of the sand spit wild grape vines abound, and in the fall the abundant supply of ripe grapes calls many birds to the feast. Robins have been found there later than elsewhere in the region under consideration.

As the sand spit widens northwestward large trees, mostly cottonwood, become more numerous just marshward from the crest, with a few clumps of wilows each side of them, then a variable width of grass covered sand, in places reaching a width of more than ten rods, and finally the marsh border of bushes with their fringing smaller trees. Where points of the sand spit reach out into the marsh the bush and tree growth form considerable thickets in which the smaller birds, including the thrushes, woodpeckers, jays and crows, and even the Woodcock and Whippoorwill, find congenial sur-

roundings. Sharp-shinned Hawks are also usually found here, and occasional Crows and Meadowlarks. During the heaviest migrations not only are such places full of all sorts of birds, but they even spill over upon the sand meadows and beach, and fly out into the marsh vegetation. Many strictly wood warblers have often been observed feeding like shore birds near the water's edge on such occasions.

Westward from the mouth of the Black Channel, accompanying the more open waters of the bay proper, the sand spit widens, and for the most part is covered with a more or less dense forest marshward from the crest, with occasional and usually small areas of bare sand or grass covered sand, except in the dune region where the blowouts between the dunes cause many extensive bare sand areas. These forested areas correspond to forested areas of the adjacent mainland, except that the species represented are more numerous, and there are areas of considerable cedar thickets. For a more detailed account of the vegetation the reader is referred to the two papers cited above.

It should be noted that from a width of less than twenty rods at its eastern terminus at Rye Beach the marsh widens and opens westward to its western end where there is open water and a distance of two miles between Cedar Point pleasure resort and the docks of Sandusky, and that the distance westward to Marblehead is considerably farther and across open water. Kelley's Island is plainly visible some seven miles northwestward.

Pelee Island is the largest and most northerly island of the archipelago lying between Sandusky and Point Pelee. Its physical features are strikingly similar to those of the greater part of Point Pelee, but the interior marshes are less extensive now, having been drained and utilized for agricultural purposes. Its southern end closely resembles the southern end of Point Pelee, with practically the same vegetation and beach formations. On all of my visits to the island during the autumnal migrations I have found all species of migrating birds ranging southward along or parallel to the east shore

line, none at all along the west side. I regret that no studies have been conducted during the vernal movements.

Middle Island is a verdure covered lime-stone ledge some twenty rods in width by ninety or more rods long, the long axis lying nearly east and west, thus lying directly athwart the south point of Pelee Island, and some four miles distant. There is a border of trees of considerable size and a peach orchard occupies the interior. A light-house stands at its eastern end. The only inhabitants are the light keepers. Here, in late August and early September, warblers of many species were swarming. In 1908 the sand ridge which has been built up at the western end contained many nests of Common Tern. In other years no terns' nests were found here.

Kelley's Island forms the first stepping stone for the northward moving birds, being separated from the headland of Marblehead by a strait of water about three miles wide. Like Put-in-Bay it is a mass of limestone rising out of the lake. Extensive quarrying of the limestone has been in progress for years. There is a fringe of trees everywhere except on the northern exposure, while the western third contains an extensive peach orchard with bordering woods of considerable extent. The highest point of this island is seventy-five feet above the lake level. It is about two miles from Middle Island. This island is a considerable fragment of the mainland, which Mosely says was once clearly a part of the mainland promontory, with probably low or even marshy ground connecting it with Marblehead. Indeed, there are historical accounts of crossing by Indians and others, with only narrow channels to swim.

It would therefore appear that at some time not so far distant these islands were elevated limestone masses of a nearly continuous land barrier connecting Point Pelee with Marblehead. Doubtless also the Bass Island group with the adjacent smaller islands, at the same time were connected with Catawba Island. The Hen and Three Chickens, East Sister and North Harbor seem to form another group of the same nature, with a possible connection with the

Ontario shore through the shoal north of them. Whatever the facts may be it seems clear that at no very ancient date the land masses were much more extensive and much nearer together, and the expanse of water over which the birds must pass to and from the north much less than at present.

I have selected Pelee, Middle, and Kelley's Islands for brief descriptions because they seem to form the most important highway of migration, and because they represent the types of islands forming this archipelago except the gravel islands of Big and Little Chicken, where the Common Terns' nest in great numbers. These small islands are limestone ridges covered with gravel. Big Chicken is an angular island of perhaps two acres extent, with one willow tree (there has been another tree which recently blew down), a mass of gourd vines in the summer, and a small fish house. Little Chicken is a narrow ridge of limestone rock, with outlying ledges of considerable extent on all sides nearly reaching the surface and hence protecting this narrow ridge from storm waves. There are several small willow trees and bushes along the north border, and a dense growth of 'smartweed' each side of the gravel ridge which occupies its center. About a rod in width and fully ten rods in length of this island lies above summer storm waves. Terns' nests are placed as thickly all over this area as it is possible for the birds to sit without serious quarreling.

Put-in-Bay is like Kelley's, but larger and with more woods and fields. It rises to about 69 feet above the lake level at the hotel. Middle Bass is only 11 feet above the lake level, with few trees, but extensive vineyards, and a small pond where King Rails' nests are numerous. North Bass rises twenty-four feet. It has considerable woods and relatively few fields. The related small islands do not present any unusual features.

While North Harbor Island belongs to the type of larger islands it presents some interesting features. It is a limestone ridge trending nearly due north and south, not above ten rods wide by three times that length, covered by a dense growth of deciduous trees, most numerous among which is the hack-



berry, with a few cherry trees and berry bushes. A thick grass grows along the forest-margin and even beneath the trees. On every visit there have been large numbers of nests of Common Tern everywhere except in the middle of the forest. On the 1904 trip to this island numbers of large snakes, presumably 'Black' snakes (*Bascanion constrictor*) were found, and the terns' nests were much fewer than on other visits. This island, if any of the group, would be the one best suited for the nesting of the Herring Gulls, but there has never appeared any evidence of the nesting of these birds on the island, nor on any others of the group. It is true that the gulls have been numerous in this region on every visit, but so are they all summer near the south shore of the lake. It is likely that they are not breeding birds.

The mainland region under discussion lies mostly within the basin of Lake Erie when it was at flood. The oldest and southernmost beach lies about 4 miles north of Oberlin, swinging up the Black River valley to within a mile of a line running through Oberlin east and west, and up the Vermilion River valley to Birmingham. The vegetation of the region is typically Carolinian, and differs little from that of the north shore of Lake Erie. The two rivers mentioned, and the Huron River, have worn deep, narrow gorges well into the shale which underlies the whole eastern part of the region, in places capped with sandstone. Westward and Put-in-Bay quadrangles, the outcropping rock is limestone. All of the streams trend in a general north and south direction. The valley of the Sandusky River is clearly the most important one from a migrational standpoint, connecting, as it does with the head waters of the Scioto. I believe that proof will be forthcoming that one of the main "fly lines" across Ohio, for both vernal and autumnal migrations is this Scioto-Sandusky River-Pelee route. It will be necessary to establish several observation stations from the Ohio River to Point Pelee, including each of the islands in the direct line, to conclusively prove it.

My visits to the northerly lying islands indicate that a

rather weak autumnal movement occurs across North Harbor, East Sister, and the Bass group to Catawba, that a strong autumnal movement occurs along the Point Pelee-Marblehead route, and that there is a desultory westward and southward movement from Pelee Island to the Bass group and from there to Catawba. As to the crossing at other places, notably from Point Pelee directly to the Ohio shore, which Taverner and Swales strongly favor for certain species, I have but one bit of evidence, during the seasons of migration. During a southward movement in the middle of August a patrol of the beach from Rye Beach to the Lake Laboratory, a distance of six miles, yielded 12 Red-headed Woodpeckers, 4 Oven-birds, 3 Red-eye Vireos, and unidentifiable remains of several other small birds washed upon the beach. The most of these were within three miles of the Lake Laboratory. The night had been cloudy and the wind northwest, brisk. If these birds had been crossing by the island route when they perished in the waters the wind would have drifted them to the place where we found them. If they had been crossing to Huron they would have been driven on the beach near Vermilion where we found none washed up.

During the winter I have often seen Snowflakes and Horned Larks coming from the north, and giving clear evidence of having flown far. In every instance they were flying just above the ice, and tumbled rather than alighted upon the sand of the beach, evidently in an exhausted condition. These winter observations cover the whole line of beach from Lorain to Cedar Point.

The only birds I have seen striking out northward across the lake as if to cross, during the vernal migration, have been the Sharp-shinned and Broad-winged Hawks. I have seen many other species start out boldly, some even lost to sight for a short time, others not venturing so far, but all eventually reappearing and finally giving it up.

I have been unable to secure any hearsay evidence of extensive migrations from the north anywhere along the south shore west of Lorain except in line with the islands. At the

Lorain lighthouse there have been night visitations of migrating small birds of many species, but it has not been possible to prove from what direction they came to the light. While it may be true, as Taverner and Swales affirm, that some birds do cross the lake directly from Point Pelee theirs is the only direct evidence of it. Of course it would not be possible for them to see the birds for any considerable portion of the whole distance between the Point and Huron on the opposite shore, where they would presumably fly, so that the birds might turn westward to Pelee Island after passing beyond their vision. I am strongly inclined to think that exactly this does happen with Purple Martins, all of the swallows and most of the blackbirds, for I have seen them coming to the easternmost point of Pelee Island from nearly due east, then pass down the east shore of the island to the extreme south point of sand, thence across to Middle Island, and when we were between Middle and Kelley's and on Kelley's, they were continuing on to Kelley's. Again, when we were sailing midway between Kelley's and Marblehead the migrating birds were passing from Kelley's to Marblehead. During this same period of movement we also sailed out eastward into the open lake but saw no birds passing anywhere, nor were any arriving anywhere along the Ohio shore from Cedar Point to Lorain although there was a steady stream passing over the island route at the same time.

The only occasion when I have been in a position to check up the work of Taverner and Swales at Point Pelee was on September 17, 1906, when they state<sup>1</sup> that there was a migration of Sharp-shinned Hawks passing down the Point and out across the lake for the Ohio shore. On that date there was no evidence of any arrival of Sharp-shins on this side east of Sandusky nor on preceding or subsequent days as far as I could learn. So large a flight would certainly have been noticed if the birds had crossed directly unless, indeed, they rose to great heights and continued so well inland.

In the absence of direct evidence from co-operative work

on both sides of the lake and among the islands any discussion of the routes taken by the birds in their southward movements is too academic to be profitable. I hope that in the next few years some fairly extensive and complete work of this kind may be accomplished and the question settled.

The writer is painfully aware of the shortcomings of this list, but he feels sure that it is wiser to publish it now than to wait until comparisons with the list by Taverner and Swales for Point Pelee would lose value by reason of so great discrepancies in the time covered by the work at the two places. This list should be regarded as preliminary.

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1. *Colymbus auritus*.—Horned Grebe.

An irregular and not often common spring migrant, but usually an abundant fall migrant, when it is found in large companies in the shallow water between the shore and the outer bar on the lake. Relatively few individuals are ever found on the waters of the Bay at any time. Its earliest date of arrival in spring was March 25, the median date being April 16; the median date of departure for seven years is April 21, the latest date being May 17, 1908. The median date of arrival in fall is October 10, the earliest date being September 23, 1907. It usually remains, but in small numbers, until the first severe weather—December 27, 1907. Scattered individuals are found on small inland waters, and on the streams. Occasionally exhausted and starving individuals are found in mid-winter in towns or cities.

When the numbers are so great that large companies are formed there is a perpetual conversational undertone decidedly pleasing in quality, accompanied with a sort of play among the birds. There is usually little concerted action, whether resulting from sudden fright or otherwise, but I have seen a flock of nearly 200 individuals dive almost on the instant.

2. *Podilymbus podiceps*.—Pied-billed Grebe.

A regular and fairly common migrant, but never in such numbers as the last species. A few remain all summer in the marshes and very likely breed there, but I have not yet found birds with their young. At Cedar Point it is just as clearly a bird of the marshes as the last species is of the open lake. Occasionally individuals are seen on the lake side of the sand spit, especially late in the spring migration. The maximum number of individuals forming a company seldom exceeds a dozen, and from two or one to four or five is far

more usual. It is next to impossible to get one of these birds to rise from the water, but they dive on the least pretext, and may remain hidden with only the bill showing for long periods. On the Oberlin Water Works reservoir they often remain for weeks at a time, but seem never to become accustomed to the presence of people on the bank.

The median date of arrival at Oberlin is April 8, the earliest being May 28, 1904. At Cedar Point the median date of arrival is March 19, the earliest being March 16, 1907. They first reach Oberlin about October 1, and the last leave Cedar Point about November 4. At any time during the periods of migration one or two may be found



Fig. 2. The Dune Section, looking southwards from the Lake Laboratory. To the left are the dunes and the blowouts, the lake in the distance. Between the dunes and the bay on the right is the forest strip, here mainly consisting of the *Ulmus-Acer* and *Ailanthus* formations. (Photo by Professor Herbert Osborn.)

on the smallest and most insignificant ponds, where it is an easy matter to make a hand capture, the birds not being able to get under way in flight from so small a water area, and of course unable to escape by diving in a few inches of water.

### 3. *Gavia immer*.—Loon.

Always scarce, even at Cedar Point, so that migration dates are unreliable. One or two are usually found on the Oberlin Water Works reservoir about the middle of April, remaining from one to

ten days. There was a female there on May 21, 1901. My only fall records are October 22, 1897, and November 4, 1907. This apparent rarity is probably somewhat due to my short and infrequent studies along the lake. But the Loon is scarce at any time of year, and clearly does not breed in Ohio now.

4. *Gavia arctica*.—Black-throated Loon.

The only record of this bird's occurrence within the region is that given by Dr. J. M. Wheaton for Sandusky Bay in the fall of 1880 on the authority of Mr. H. E. Chubb, then of Cleveland, who mounted the specimen.<sup>1</sup>

5. *Uria lomvia*.—Brunnich's Murre.

During the visitation of 1896 four birds of this species were captured at Lorain, three in Sandusky Bay, and others reported from Ottawa county during the last half of December. Professor E. L. Moseley tells me that there were either five or seven in Sandusky Bay in December, 1908, some of which were captured. It appears that the birds do not survive long after reaching the waters of Lake Erie.

6. *Stercorarius pomarinus*.—Pomarine Jaeger.

Occurrences of this species are limited to a specimen in the collection of Mr. A. Hengartner, of Lorain, where it was secured, and the one reported in Cook's Birds of Michigan by Professor E. L. Moseley, for Sandusky, October, 1889.

7. *Stercorarius parasiticus*.—Parasitic Jaeger.

The records are as follows: Sandusky Bay, September 13 and 20, 1889, and October 6, 1895, E. L. Moseley. Near Sandusky, November, 1895, two specimens taken. F. M. Comstock.<sup>2</sup>

8. *Larus leucopterus*.—Iceland Gull.

One specimen was taken at Lorain, December 22, 1888, and preserved by Mr. L. M. McCormick for the Oberlin College museum. If it occurs with any regularity upon Lake Erie it has thus far passed unnoticed.

9. *Larus argentatus*.—Herring Gull.

In the sense that it is present at all times of year it is a resident if the proviso is added that it does not breed in the region. The birds found in summer are clearly not breeding birds, although some of them are in full adult plumage. During hard winters, when the ice covers the lake extensively, the birds are less numerous and

<sup>1</sup> Geological Survey of Ohio, IV, 1882, p. 565.

<sup>2</sup> The Auk, XIII, p. 171.

are gathered in the vicinity of the cities, or in the regions where fishing through the ice is practiced extensively. Apparently there is always some open water in Sandusky Bay and the marshes, and here I have seen the birds, to the number of fifty, lined up along the the linear openings in the ice which mark a line of decaying swamp vegetation. The gulls appear to spend the night on the ice in the vicinity of such feeding places. After a hard winter there is pretty clearly a northward migration, during which individuals visit the Oberlin Water Works reservoir.

10. *Larus delawarensis*.—Ring-billed Gull.

The presence of this gull all along the lake front has been suspected, but it has not been until the more recent intensive studies at Cedar Point that positive proof of its regular occurrence has been obtained. It is clearly much less common than the Herring Gull. None have been observed in winter, and none during June and July.

11. *Larus philadelphia*.—Bonaparte's Gull.

This is a regular migrant, but is far more numerous during the southward movement than at other times. None have been recorded in July, and almost none in June and August. The migratory movement appears to occur along the river courses and few fly over the regions between. Thus at Oberlin, which lies between the two river courses, only a few scattered individuals are seen, while at Cleveland, and especially at Sandusky, many hundreds pass. In my experience this gull is far more numerous on both sides of Cedar Point sand spit than elsewhere along the lake, and the times of maximum numbers occur between November 1 and December 30. During the last three winters I have found a flock of from 50 to 500 birds ranging along the shores of the sand spit as long as there remained open water, which was well into January. They act much like terns, diving headlong into the water for fish, but can always be readily distinguished from them by the almost sparrow-like conversational notes instead of the harsh *ter-r-r* of the terns. They seem to prefer the vicinity of the lake beach to the marshes for feeding grounds, possibly because small fish are more numerous there. On the occasions when the pent-up swamp waters at Rye Beach have broken through into the lake carrying all sorts of debris upon their floods, these gulls have collected at the place in great numbers, feeding.

The northward migration begins from the first to the middle of April, and all have passed north by the first of June. A few individuals return by the first of September, but the flood does not appear before the first of November. Professor E. L. Moseley states that over 2,000 of these birds were feeding in the waters and marshes east of Sandusky on November 12, 1904.

12. *Sterna caspia*.—Caspian Tern.

Records of this tern are confined to Sandusky Bay and the west half of the sand spit and adjoining marshes and lake. Two were recorded September 13 and 23, 1907, and one May 4 and 12, 1908. They were feeding in the same places, but somewhat apart from the Common Terns. Their greater size was clearly evident.

13. *Sterna hirundo*.—Common Tern.

Common from about May 1st to about October 1st. The only breeding places thus far discovered are upon Big and Little Chicken Isl-



Fig. 3. The Black Channel and the *Phragmites-Typha* Marsh Formation. The forests in the far distance are at the edge of the main land on the other border of the marsh, more than two miles distant. Near here the Bladpates and Scoup Ducks abound on close days. Black Ducks and Mallards feed in the vegetation covered areas near. (Photo by Otto Jennings.)

ands, and upon the reef of Chick when it is sufficiently uncovered by water, upon North Harbor, Starve Island, the gravel ridge at the west end of Middle, and over the top of the Rattle of Rattlesnake Island. There are old reports of nestings upon Gull Island, which has never been above the wave wash since my studies began. It is pretty clear that the nesting places are greatly restricted since the advent of the white man. Hen Island, which is reported as having



been a favorite nesting place, is now inhabited and no terns nest there. As nearly as can be estimated there are probably 3,000 nesting pairs within this region, and perhaps half as many non-nesting birds which range freely over the region. In the region of Cedar Point there have always been considerable numbers during my studies. In late August and early September there have always been considerable numbers of winter plumaged Black Terns about the nesting islands and mingling among the flying Common Terns, adding their protests against the unwelcome visitors.

14. *Hydrochelidon nigra surinamensis*.—Black Tern.

A variable number of Black Terns breed in the marshes. In favorable summers I have counted upwards of twenty pairs, but there are usually not so many. I therefore can hardly agree that it is a "common" breeder, but it is certainly regular. It selects for a nesting region the somewhat open central parts of a considerable area whose margins are thickly grown up with marsh vegetation so that a boat can be pushed across and into the nesting area with much difficulty. The nest is placed on decaying vegetation which is barely more than flush with the surface of the water, many times, perhaps always, as Mr. W. F. Henninger thinks, upon a submerged muskrat house. I have found fresh eggs during the first week of July. The birds are courageous in the defense of their eggs and young, even striking the head of the intruder. The first birds appear in spring near the first of May, and the last have passed south by September 25. During the migrations they are not infrequently seen along the river courses.

15. *Phalacrocorax auritus*.—Double-crested Cormorant.

Only twice have my visits to Cedar Point coincided with the visitations of this species. On April 29, 1907, I found a specimen which fishermen told me had been shot four or five days previously when there were considerable numbers in the region of Cedar Point. On May 13 I recorded one specimen, and again on November 4, at Cedar Point. If fishermen are reliable there is a regular migration of this species across the region of Sandusky not far from the first of May. Moseley reports one on October 7, 1903.

16. *Pelecanus erythrorhynchos*.—American White Pelican.

There are two records for the immediate vicinity of Oberlin. Specimens were not taken but the records were made by persons who are familiar with the species in other places. One was in early May, 1890, the other at the Oberlin Water Works reservoir in the spring of 1897. I have been unable to secure the exact dates.

17. *Mergus americanus*.—American Merganser.

Present on the lake, except during and in summer, the middle of severe winters. It is sometimes numerous enough to be called common, but ordinarily less than fifty individuals are recorded along ten miles of lake front. Immature and female plumages outnumber full adult male plumages about five to one. The decided preference of this species for the open waters of the lake has often been noted. There are very few records of its occurrence in the waters of the marshes. It seems to prefer to feed near the shore.

18. *Mergus serrator*.—Red-breasted Merganser.

This is the commoner one of the mergansers during both migrations, when hundreds are sometimes recorded in a single day, but it is less sure to remain all winter. It is more often found in the marshes feeding in company with other ducks. My migration records, which are not as complete as one could wish, indicate that it arrives from the south about the middle of March, passes north about the middle of May, returns from the north about the first of November, and departs southward again during the cold weather of January.

19. *Lophodytes cucullatus*.—Hooded Merganser.

Its occurrence in the region warrants the term "scarce." From one to half a dozen individuals are seen each year, but gunners report it as not uncommon during the height of its migrations. My records indicate that it moves northward from the last week in March to about the first of May, and south during nearly the whole of November, but migration dates are too few to make this certain. I have found more individuals along the rivers than in the marshes and on the lake.

20. *Anas platyrhynchos*.—Mallard.

Mallards reach the marshes at Sandusky about the first of March, or as soon after that as there is much open water; are common during the most of March, thinning out decidedly with the approach of warm weather, and all but stragglers are gone by the middle of April. Individuals are occasionally seen in June and July, but if any breed there is no other evidence than such irregular occurrence gives. The first migrants appear near the first of October, the numbers increase to common during November and most have gone with the first touch of winter. Occasionally a few remain well into January in mild winters. While this may properly be called one of the common ducks at Cedar Point it is by no means as common as the next species. It is more often put up from the vegetation covered parts of the marsh than from the open waters of it. On gunning

days one looks for it on the lake, but at other times it is seldom seen on the lake.

21. *Anas rubripes*.—Red-legged Black Duck, and *Anas rubripes tristis*.—Black Duck.

Sufficient data is lacking to determine the exact status of the two forms, hence the remarks will apply to the undivided species. It is clear that both forms occur, as proved by specimens examined and preserved.

This is the commonest of the larger ducks, if, indeed, it is not the



Fig. 4. The second cove south of Biemiller's Cove. The *Nymphaea advena* Consocias mingled with the *Castalia tuberosa* Consocias, *Typha* in the immediate background and *Phragmites* further back. A type of the feeding ground of Pied-billed Grebes, Black Ducks and Mallards are often flushed from such situations in the early morning. Coots are also found here, and among the bordering vegetation Florida Gallinules may be found in summer. (Photo by Otto Jennings.)

commonest of all ducks. Gunners report "millions" in the height of the gunning season. Such an estimate appears less extravagant when one realizes that the birds, almost crazed by the constant rattle of the guns, are flying back and forth and up and down, the same individuals reappearing many times in the course of an hour. I have seen many hundreds in a single day, but I doubt if more than a few

thousands are even present on any day. This species may constitute a third of all the ducks on some days. The Black Ducks flush from their feeding places in the swamp vegetation readily. Indeed, it is next to impossible to stalk them to within gun range. They rest on the open waters of the bay, or well out in the lake, where great flocks often blacken its surface. The first arrive about the first of March and the bulk have gone north by the first of April, but a few generally linger even well into May. The first return about October 15, and the numbers reach a maximum within two weeks. There are almost always considerable numbers present until cold weather in late December or early January closes the marshes. In mild winters a good many remain all winter.

22. *Chaulclasmus streperus*.—Gadwall.

An examination of the bags of the hunters usually results in a few specimens of this fast disappearing duck. It seems to be one of the rarest of the ducks now, but I am told that not more than fifteen years ago it was common. I have no reliable migration dates.

23. *Mareca americana*.—Baldpate.

During the spring migrations of 1907, 1908, and 1909, it was one of the more common species of ducks at the Sandusky marshes, becoming common on the 18th, 16th, and 15th of March respectively, and remaining so until May 6, 1907, and April 2, 1908. Of course it flies out to the lake when hard pressed in the marshes, but the greatest numbers have been found on the larger areas of open water in the marshy regions east of the mouth of Black Channel. One need never be in doubt about the identity of this species when the notes are once learned. To windward of large flocks I have heard the mingled notes of the flock at a distance of nearly a mile. On Mondays, when the Ohio game laws forbid shooting, these ducks gather in companies of hundreds on a certain stretch of open water in the marsh and may there be seen courting, playing and fighting, or tipping up while feeding.

The migrations begin with the second general migration wave—in the second week of March generally—and the bulk are gone north by the middle of April. Individuals and even small flocks may remain as late as May 20 (1907). Fall records are entirely wanting from my books. Almost none of these ducks are found far from the marshes, but when they are I have found them singly or in twos on the small field ponds.

24. *Nettion carolinensis*.—Green-winged Teal.

I have only three records, all of which are for the Oberlin Water Works reservoir, as follows: March 29 and October 16, 1899, one

each time; March 27, 1905, one. Gunners' statements are not satisfactory, but they seem to indicate that this teal is scarce at the marshes. I have not seen specimens taken there. Either the numbers have greatly decreased or this is not one of the fly lines of this species.

25 *Querquedula discors*.—Blue-winged Teal.

Judging from actual records only a few pairs breed in the marshes, and none in the inland regions. It is only occasionally common in the marshes during the migrations. The most of my



Fig. 5. In the third cove south of Biemiller's Cove. The *Nelumbo lutea* Consociates mingled in the left background with *Pontederia cordata* Society; the general background being the *Phragmites phragmites* Consociates of the Mars's Formation. Long-billed Marsh Wrens and Florida Gallinules prefer such places. (Photo by Otto Jennings.)

records are of from one to a dozen individuals. Single individuals visit the Oberlin Water Works reservoir during the spring migrations, and occasionally one is seen on the small field ponds inland. The Blue-wings mostly remain away from groups of other species, feeding in the vegetaion covered areas of the marsh, from where they do not rise readily.

Oberlin migration dates are for arrivals April 21, departures May 4, Cedar Point arrivals March 30, bulk departures April 25. The last seen in 1907 was November 19.

26. *Spatula clypeata*.—Shoveller.

Another relatively uncommon species. On April 6, 1902, and September 25, 1899, there were visitations to the Oberlin Water Works reservoir. Small companies are usually seen at the east end of the marshes during late March and early April. Dates of occurrence are too few and too variable to indicate the times of migration. Gunners report it as regular but scarce at both seasons. The evidence seems to point to a marked decrease in numbers during recent years. My experience with it has been that it prefers small areas of open water in the narrower parts of the marsh.

27. *Dafla acuta*.—Pintail.

This is still a common duck in the migrations, but its numbers are certainly decreasing. Up to 1900 numbers were regularly recorded in their passage across the country almost anywhere, but since that time practically none are seen except in the marshes. There are days when this is the commonest of the ducks, but the periods of such abundance are short. Small flocks have visited the Oberlin Water Works reservoir early in the morning, but left with the first signs of the awakening of the populace. They are nervous and wary always, but doubly so after a short experience with the gunners at the marshes. They are usually seen in the companies which are made up of Baldpates and Lesser Scaups, with a few others, in the middle of an extensive open area near the mouth of Black Channel, or farther west in the open Bay, where the vegetation reaches the surface.

My earliest spring record is February 22, 1908, following a mild winter, and the latest spring record is April 29, 1907. Fall records are September 25, 1899, to November 26, 1907.

28. *Aix sponsa*.—Wood Duck.

My experience with this duck in this region indicates that the minimum numbers were reached from 1899 to 1901, and that since the latter year it has been increasing perceptibly. During the three years mentioned none were seen. In 1902 four were seen; none in 1903; but since then it has been of regular occurrence. Taxidermists report a marked increase in the number received, and gunners speak of an increase. While no nests have been found there is every other reason for believing that a few pairs breed within the limits of the region. Stringent laws for the protection of this duck have proved of little avail.